



## ROLE OF GASTROGRAFIN IN SMALL BOWEL OBSTRUCTION: A PROSPECTIVE STUDY

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### ABSTRACT

**Background :** Small bowel obstruction is one of the most common surgical emergencies and main cause of hospital admissions. Management protocols usually start with a conservative approach that may be successful in some cases, whereas in others it will end eventually by laparotomy with its associated morbidity and mortality. Administration of gastrografin has been proved to be helpful in diagnosing the site of obstruction and gastrografin acts as a therapeutic agent thus minimizing the need for surgery.

**Methods:** This prospective study was conducted in the Department of Surgery, GMC Jammu with effect from October, 2015 to September 2017. 32 Patients who were admitted in emergency in our unit as a case of small bowel obstruction were included in study.

**Results:** The mean age of patients was 24.30±6.30 years. The number of male patients was 10(41.66%) and number of female patients was 14(58.34%). Sixteen patients (66.66%) out of twenty four responded to gastrografin trial. The dye reached ileocaecal valve in four patients (25%) within 4 hours, in seven (43.75%) patients, it reached ileocaecal valve in 12 hours whereas in five patients (31.25%) it reached large bowel in 24 hours. In eight patients (33.34%) there was no passage of dye beyond ileocaecal valve and they required surgical intervention. The average duration of hospital stay in the patients managed conservatively was 6.20 days whereas that in the patients managed operatively was 12.50 days.

**Conclusion:** Gastrografin may have a valuable role in the management of Acute small bowel obstruction (ASBO), whether diagnostic or therapeutic, but a randomized controlled trial is needed to prove its effectiveness in reducing surgical intervention rate and hospital stay time.

**KEYWORDS :** Gastrografin, Small Bowel Obstruction, hospital stay, surgery

### INTRODUCTION:

Intestinal obstruction is complete or partial blockage of intestinal tract. The main causes for the obstruction are either mechanical such as adhesions, inflammation, tumours, volvulus, and hernia or non-mechanical such as paralytic ileus, metabolic abnormalities, or mesenteric ischaemia<sup>1</sup>. Almost 75% of the obstruction cases are considered to be the consequence of post-surgical adhesion<sup>2</sup>.

The management of small bowel obstruction is still a substantial clinical challenge. These patients are usually difficult to diagnose and manage. Patients with strangulation require emergency operation but management of remaining patients is more difficult. In cases of partial obstruction, a trial of conservative treatment can be given but the duration of this trial is not yet decided<sup>3</sup>, also delaying the conservative treatment for more than 24 hours increases the rate of post operative complications and hospital stay. Small bowel obstruction either complete or incomplete is difficult to differentiate clinically or with radiographs<sup>4</sup>. The conventional approach is to offer conservative treatment for 24 hour as most obstruction that resolve is likely to do so within this time<sup>5</sup>. If the patient is not relieved of symptoms after 24 to 48 hours, surgery will be required.

Water-soluble contrast medium has been evaluated recently in an attempt to predict the need of surgery and as a therapeutic agent. Gastrografin is the most widely used water-soluble contrast agent and its role as a diagnostic as well as a therapeutic agent in intestinal obstruction is well assessed. It is a mixture of sodium diatrizoate and meglumine diatrizoate along with a wetting agent (polysorbate 80). Its osmolarity is 1900 mOs/L, which is around six times that of extracellular fluid. It acts by moving water into small bowel lumen, thus diluting the bowel contents, decreasing bowel wall oedema, and enhancing smooth muscle contractility<sup>6,7</sup>. The purpose of this study was to evaluate the possible use of gastrografin in the management of small bowel obstruction, its safety and effectiveness in reducing the hospital stay and operative intervention rate.

### MATERIAL AND METHOD:

This prospective study was conducted in the Department of surgery with effect from October 2015 to September 2017. 32 Patients who were admitted in emergency in our unit as a case of small bowel obstruction were included in the study. The diagnosis of intestinal obstruction was made on the basis of history, clinical examination and radiological

features. Radiological signs to be looked for included distended fluid and air-filled gut loops, air-fluid levels, and reduction or elimination of gas and faecal matter in the colon. After the provisional diagnosis of the intestinal obstruction, oral feed was stopped to the patients and intravenous fluids were started. Ryle tube was inserted in all the patients for decompression and for administration of the contrast. After a period of 24 hour wait and nil per oral, all patients were administered 100 ml gastrografin diluted with normal saline. X-rays of an erect abdomen were taken at 4, 6, 12, and 24 hours after the contrast administration. The treatment procedure was considered successful if Contrast reaches the ileocaecal junction, as visualized on an erect abdominal X-ray. Relief of pain and vomiting, decrease in abdominal girth, passage of flatus, and bowel sounds on auscultation were regarded as the subjective end points. Criteria for surgical treatment included complete bowel obstruction, as suggested by inability of the contrast to progress beyond a discrete point in serial X-ray films. Patients who developed signs of bowel strangulation and peritonitis at any time during the conservative period would undergo surgery. Patients who passed the period of conservative management and did not show significant improvement both clinically and radiologically would be subjected to surgical interference even in the absence of ischemic signs due to failure of conservative management.

### Exclusion criteria:

Patients with a picture suggestive of strangulation or peritonitis at the time of presentation, patients below 12 yrs of age, patients with a known history of allergy or hypersensitivity to iodinated contrast agents, patients with asthma or atopy, patients with inflammatory bowel disease or tuberculosis, and patients with a history of irradiation to the abdomen or documented intra-abdominal malignancy.

### RESULTS:

32 patients presented to emergency in our unit with features of intestinal obstruction during the above said period. Out of which eight patients were excluded from the study because they did not fulfil the inclusion criteria as six out of these eight had signs of strangulation at admission and required immediate surgery and two were less than 12 years of age. 24 patients in whom conservative treatment was not successful even after 48 hours; trial with oral gastrografin was given to relieve obstruction. The mean age of patients was 24.30±6.30 years. The number of male patients was 10(41.66%) and number of female patients was 14(58.34%). Sixteen patients (66.66%) out of twenty four

responded to gastrografin trial. The dye reached ileocaecal valve in four patients (25%) within 4 hours, in seven(43.75%) patients it reached ileocecal valve in 12 hours whereas in five patients(31.25%) it reached large bowel in 24 hours. In eight patients (33.34%) there was no passage of dye beyond ileocecal valve and they required surgical intervention. Five of these cases underwent adhesiolysis, whereas the other three underwent resection and anastomosis. The average duration of hospital stay in the patients managed conservatively was 6.20 days whereas that in the patients managed operatively was 12.50 days which was statistically significant ( $p < 0.05$ ).

#### DISCUSSION:

Intestinal obstruction is one of the most common causes of abdominal emergencies, and it is associated with a significant rate of morbidity and mortality. Most commonly, small bowel intestinal obstruction occurs as a result of adhesions, which mostly occur after abdominal surgeries<sup>8</sup>. There are controversies in the management of Small bowel obstruction. But a general consensus is that patient should receive a trial of conservative treatment unless there is fear of strangulated bowel. However, there is no agreement on the duration of this trial. It was also found that significant complications can occur in those patients in whom surgery is delayed for more than 48 hours<sup>9</sup>.

The average duration of hospital stay in the patients managed conservatively was 6.20 days whereas that in the patients managed operatively was 12.50 days which was statistically significant ( $p < 0.05$ ). Similarly a study done by Safamanesh S et al<sup>10</sup> showed hospital stay of 4.6 days in patients in whom gastrografin trial was given. Another study done by Gorecki W et al<sup>7</sup> showed similar results as of our study. Sixteen patients (66.66%) out of 24 responded to gastrografin trial. The dye reached ileocaecal valve in four patients (25%) within 4 hours, in seven (43.75%) patients it reached ileocecal valve in 12 hours whereas in five patients (31.25%) it reached large bowel in 24 hours. Burge J et al<sup>11</sup> in their study showed that 73% of patients responded to gastrografin trial. Similarly another study done by Nasrin et al<sup>12</sup> showed a successful rate of 90. In eight patients (33.34%) there was no passage of dye beyond ileocecal valve and they required surgical intervention. Similarly a study done by Choi H K et al<sup>7</sup> showed that 26.32% of patients required surgery in whom dye did not reach large bowel which is similar to our study.

#### CONCLUSION:

In our study we concluded that gastrografin administration in Small bowel obstruction is safe; it can be used therapeutically because it has a role in resolution of small bowel obstruction. Gastrografin can also help in early diagnosis of cases of small bowel obstruction that requires surgery. Thus, it also shortens the hospital stay and morbidity.

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